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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/035,584  
Filing Date: December 28, 2001  
Appellant(s): STEELE, GUY L.

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Guy L. Steele, Jr.  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 04/07/2006 appealing from the Office action mailed 05/05/2005.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

The Appeal of In re Application of Guy Steele, Jr., U.S. Patent Application No. 10/035,747, in which an Appeal Brief was filed concurrently herewith.

The Appeal of In re Application of Guy Steele, Jr., U.S. Patent Application No. 10/035,595, in which an Appeal Brief was filed concurrently herewith.

The Appeal of In re Application of Guy Steele, Jr., U.S. Patent Application No. 10/035,579, in which an Appeal Brief was filed concurrently herewith.

The Appeal of In re Application of Guy Steele, Jr., U.S. Patent Application No. 10/035,587, in which an Appeal Brief was filed concurrently herewith.

The Appeal of In re Application of Guy Steele, Jr., U.S. Patent Application No. 10/035,647, in which an Appeal Brief was filed concurrently herewith.

The Appeal of In re Application of Guy Steele, Jr., U.S. Patent Application No. 10/035,580, in which an Appeal Brief was filed concurrently herewith.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

A substantially correct copy of appealed claims 1-37 appears on pages i-viii of the Appendix to the appellant's brief. The minor errors are as follows:

Re claims 6, 8, 10, 20, 22, 32, and 34, the status identifier for these claims should be "Previously Amended".

Re claims 1-5, 7, 9, 11-19, 21, 23-31, 33, and 35-37, the status identifier for these claims should be "Original".

**(8) Evidence Relied Upon**

5,995,991	Huang et al.	11-1999
5,065,352	Nakano	11-1991

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-37 are rejected under 35 U.S.C. 103(a) as being obvious over Huang et al. (U.S. 5,995,991) in view of Nakano (U.S. 5,065,352).

**DETAILED ACTION**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-37 are rejected under 35 U.S.C. 103(a) as being obvious over Huang et al. (U.S. 5,995,991) in view of Nakano (U.S. 5,065,352).

Re claim 1, Huang et al. disclose in Figures 1 and 4 a system (e.g. abstract and Figure 4) for providing a floating point product (e.g. col. 7 lines 65-66 and output of component 114 in Figure 4 as multiplication result), comprising: an analyzer circuit (e.g. components 24 and 26 in Figure 1 as detectors for detecting special operand(s) from input x and y; components 116-2 and 118-2 in Figure 4; and col. 7 lines 10-17) configured to determine a first status of a first floating point operand (e.g. output of 116-2) and a second status of a second floating point operand (e.g. output of 118-2) based upon data within the first floating point operand and data within the second floating point operand

respectively, and a results circuit coupled (e.g. 114, 150, and 122) to the analyzer circuit (e.g. 116-2 and 118-2) and configured to assert a resulting floating point operand containing an arithmetic (e.g. as multiplication and col. 7 lines 65-66) of the first floating point operand and the second floating point operand and a resulting status embedded (e.g. output of 150) within the resulting floating point operand. Huang et al. do not disclose the result is the remainder of operands. However, Nakano discloses in Figure 1 an operation to yield a remainder of two operands (e.g. abstract lines 6-14). Therefore, it would have been obvious application to a person having ordinary skill in the art at the time the invention is made to apply a method of determining a remainder of operands as seen in Nakano's invention into Huang et al.'s invention because it would enable to enhance the system performance in determining the remainder of operands by shorter the time of execution and lower the cost of operation (e.g. col. 10 lines 47-53 and col. 12 lines 20-24 of the secondary reference by Nakano).

Re claim 2, Huang et al. further disclose in Figures 1 and 4 the analyzer circuit further comprises: a first operand buffer (e.g. 112) configured to store the first floating point operand, a second operand buffer (e.g. 112) configured to store the second floating point operand, a first operand analysis circuit (e.g. 116-2) coupled to the first operand buffer, the first operand analysis circuit configured to generate a first characteristic signal having information relating to the first status (e.g. table 1 in col. 6); and a second operand analysis circuit (e.g. 118-2) coupled to the second operand buffer, the second operand analysis circuit configured to generate a second characteristic signal having information relating to the second status (e.g. table 1 in col. 6).

Re claim 3, Huang et al. further disclose in Figures 1 and 4 the first status and the second status are determined without regard to memory storage external to the first operand buffer and the second operand buffer (e.g. 116-2 and 118-2).

Re claim 4, Huang et al. further disclose in Figures 1 and 4 the memory storage external to the first operand buffer and the second operand buffer is a floating-point status register (e.g. 112 for storing the status information as example of output of 150).

Re claim 5, Huang et al. further disclose in Figures 1 and 4 the results circuit further comprises: an arithmetic circuit (e.g. 114 and col. 7 lines 65-66) coupled to the analyzer circuit (e.g. 116-2 and 118-2), the arithmetic circuit configured to produce the result of the first floating point operand and the second floating point operand (e.g. output of 114), a arithmetic logic circuit (e.g. 150) coupled to the analyzer circuit and configured to produce the resulting status based upon the first status and the second status (e.g. 150), and a result assembler coupled to the arithmetic circuit and the arithmetic logic circuit, the result assembler configured to assert the resulting floating point operand and embed the resulting status within the resulting floating point operand (e.g. 112). Huang et al. do not disclose the result or the arithmetic is the remainder of operands. However, Nakano discloses in Figure 1 an operation to yield a remainder of two operands (e.g. abstract lines 6-14). Therefore, it would have been obvious application to a person having ordinary skill in the art at the time the invention is made to add an algorithm to determine a remainder of operands as seen in Nakano's invention into Huang et al.'s invention because it would enable to enhance the system performance in determining the remainder

of operands by shorter the time of execution and lower the cost of operation (e.g. col. 10 lines 47-53 and col. 12 lines 20-24).

Re claim 6, Huang et al. further disclose in Figures 1 and 4 the multiplier logic circuit is organized according to the structure of a decision table (e.g. table 1 in col. 6).

Re claim 7, Huang et al. further disclose in Figures 1 and 4 the first status, the second status, and the resulting status are each one of the following: an invalid operation status, an overflow status, an underflow status, division by zero status, an infinity status, and an inexact status (e.g. col. 7 lines 20-22).

Re claim 8, Huang et al. further disclose in Figures 1 and 4 the overflow status represents one in a group of a +OV status and a -OV status (e.g. col. 1 lines 55-60 and col. 7 lines 20-23).

Re claim 9, Huang et al. further disclose in Figures 1 and 4 the overflow status is represented as a predetermined non-infinity numerical value (e.g. table 1 in col. 6).

Re claim 10, Huang et al. further disclose in Figures 1 and 4 the underflow status represents one in a group of a +UN status and a -UN status (e.g. col. 1 lines 55-60 and col. 7 lines 20-23).

Re claim 11, Huang et al. further disclose in Figures 1 and 4 the underflow status is represented as a predetermined non-zero numerical value (e.g. table 1 in col. 6).

Re claim 12, Huang et al. further disclose in Figures 1 and 4 the invalid status represents a not-a-number (NaN) status due to an invalid operation (e.g. col. 6 lines 39-43).



Re claim 13, Huang et al. further disclose in Figures 1 and 4 the infinity status represents one in a group of a positive infinity status and a negative infinity status (e.g. col. 9 lines 25-30).

Re claim 14, it is a method claim of claim 1. Thus, claim 14 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 15, it is a method claim of claim 2. Thus, claim 15 is also rejected under the same rationale as cited in the rejection of rejected claim 2.

Re claim 16, it is a method claim of claim 3. Thus, claim 16 is also rejected under the same rationale as cited in the rejection of rejected claim 3.

Re claim 17, it is a method claim of claim 4. Thus, claim 17 is also rejected under the same rationale as cited in the rejection of rejected claim 4.

Re claim 18, it is a method claim of claim 5. Thus, claim 18 is also rejected under the same rationale as cited in the rejection of rejected claim 5.

Re claim 19, it is a method claim of claim 7. Thus, claim 19 is also rejected under the same rationale as cited in the rejection of rejected claim 7.

Re claim 20, it is a method claim of claim 8. Thus, claim 20 is also rejected under the same rationale as cited in the rejection of rejected claim 8.

Re claim 21, it is a method claim of claim 9. Thus, claim 21 is also rejected under the same rationale as cited in the rejection of rejected claim 9.

Re claim 22 it is a method claim of claim 10. Thus, claim 22 is also rejected under the same rationale as cited in the rejection of rejected claim 10.

Re claim 23, it is a method claim of claim 11. Thus, claim 23 is also rejected under the same rationale as cited in the rejection of rejected claim 11.

Re claim 24, it is a method claim of claim 12. Thus, claim 24 is also rejected under the same rationale as cited in the rejection of rejected claim 12.

Re claim 25, it is a method claim of claim 13. Thus, claim 25 is also rejected under the same rationale as cited in the rejection of rejected claim 13.

Re claim 26, it is a computer-readable medium claim of claim 1. Thus, claim 26 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 27, it is a computer-readable medium claim of claim 2. Thus, claim 27 is also rejected under the same rationale as cited in the rejection of rejected claim 2.

Re claim 28, it is a computer-readable medium claim of claim 3. Thus, claim 28 is also rejected under the same rationale as cited in the rejection of rejected claim 3.

Re claim 29, it is a computer-readable medium claim of claim 4. Thus, claim 29 is also rejected under the same rationale as cited in the rejection of rejected claim 4.

Re claim 30, it is a computer-readable medium claim of claim 5. Thus, claim 30 is also rejected under the same rationale as cited in the rejection of rejected claim 5.

Re claim 31, it is a computer-readable medium claim of claim 7. Thus, claim 31 is also rejected under the same rationale as cited in the rejection of rejected claim 7.

Re claim 32, it is a computer-readable medium claim of claim 8. Thus, claim 32 is also rejected under the same rationale as cited in the rejection of rejected claim 8.

Re claim 33, it is a computer-readable medium claim of claim 9. Thus, claim 33 is also rejected under the same rationale as cited in the rejection of rejected claim 9.

Re claim 34, it is a computer-readable medium claim of claim 10. Thus, claim 34 is also rejected under the same rationale as cited in the rejection of rejected claim 10.

Re claim 35, it is a computer-readable medium claim of claim 11. Thus, claim 35 is also rejected under the same rationale as cited in the rejection of rejected claim 11.

Re claim 36, it is a computer-readable medium claim of claim 12. Thus, claim 36 is also rejected under the same rationale as cited in the rejection of rejected claim 12.

Re claim 37, it is a computer-readable medium claim of claim 13. Thus, claim 37 is also rejected under the same rationale as cited in the rejection of rejected claim 13.

#### **(10) Response to Argument**

##### **A. Claims 1-37 patentably distinguish from Huang and Nakano.**

*The applicant argues in pages 7-8 lines 7-18 that the examiner must show that the prior art reference teaches or suggests all the claim elements. In addition, the examiner must also show that there is some suggestion or motivation, either in the reference or in the knowledge generally available to one of ordinary skill in the art to modify the reference.*

The examiner respectfully submits that the previous Office action dated 05/05/2005 as seen above clearly addressed every single limitation cited in the claims, particularly independent claims 1, 14, and 26. For every combined feature, the examiner clearly states the suggestion or motivation, which may be either come from the reference or from the knowledge to one of ordinary skill in the art. In this case, the missing feature in the primary reference by Huang is a system for providing a floating-point remainder.

The system of providing remainder is a well-known system for widely used in division apparatus. This missing feature is found in the secondary reference by Nakano which discloses a system for providing a remainder as seen in the abstract, column 1 lines 25-60, and Figures 1 and 6. Thus, the suggestion or motivation from Nakano to combine or to apply the missing feature from Nakano's into Huang's invention in order to enhance the system performance in determining the remainder of operands as seen generally in column 10 lines 47-53 and column 12 lines 20-24 by shorter the time of execution and lower the cost of operation.

B. Neither Huang nor Nakano teaches or suggests all of Appellant's claim elements.

*The applicant argues in page 8 last paragraph to page 9 that the cited reference by Huang fails to teach or suggest all the limitations "an analyzer circuit configured to determine a first status of a first floating point operand and a second status of a second floating point operand based upon data within the first operand and data within the second floating point operand respectively" (emphasis added) because Huang's "tag value" (alleged status) is not "data within the first floating-point operand and data within the second floating point operand" and also Huang's register is not an "operand" as claimed by the applicant.*

The examiner respectfully submits that Figure 4 of the primary reference by Huang et al. clearly disclose all the limitations cited above wherein the analyzer circuit is the logic that determines the x\_tag and y\_tag as the first and second respectively status of the first and second respectively floating point operand wherein the examiner interprets

the tag and the floating-point value of the cited reference by Huang et al. as the floating-point operand of the present invention. Thus, the tag is considered as part of data within the floating-point operand wherein the floating-point operand composes of the associated tag and the floating-point value. This configuration can be clearly seen in the Figure 1 of the present invention. In Figure 1 of present invention, the first operand is composed of S, exponent, fraction (high part), and flags wherein conventionally IEEE labels the S, exponent, and fraction as floating-point value/operand. Therefore, the first operand 11A as seen in Figure 1 of present invention is the same as the X operand 116 in Figure 4 of cited reference by Huang et al. In addition, the register 112 in Figure is a memory for storing all the operands X and Y wherein each operand composed of an associated tag and a floating-point value.

*The applicant further argues in page 10 last two paragraph that the cited reference by Huang et al. fails to disclose "a resulting status embedded within the resulting floating point operand" as recited by claim 1 because the teaching results by Huang are stored and loaded separately into the tag value portion and the operand value portion.*

The examiner respectfully submits that the present claims do not clearly define or clarify how or where the resulting status is embedded within the resulting floating point operand. Based upon the Figure 4 and its corresponding specification portion of the instant applications, the claimed "embedded within" corresponds to appellant's disclosed attaching the resulting status to the resulting floating point value as clearly seen in Figure

1 of present invention. Given the case, Figure 4 of the cited reference by Huang clearly and expressively discloses or teaches a resulting status (e.g. output of component 150 label as res\_tag in Figure 4) embedded within (e.g. save, store, or attach along with result output of component 122 in Figure 4) the resulting floating point operand (e.g. output of component 122 as floating-point value in Figure 4).

*The applicant argues in page 11 last paragraph that the cited secondary reference by Nakano also fails to disclose the limitation "determining a first and second status of a first and second operand based upon data within the first floating point operand and data within the second floating point operand" as recited in claim 1.*

The examiner respectfully submits that the limitation "determining a first and second status of a first and second operand based upon data within the first floating point operand and data within the second floating point operand" is clearly shown in the primary reference by Huang which clearly addressed above along with responses to the argument. The secondary reference by Nakano does not need to disclose or teach the limitation "determining a first and second status of a first and second operand based upon data within the first floating point operand and data within the second floating point operand" because the examiner only uses the secondary reference to combine with the primary reference by Huang for disclosing the missing feature "a system for providing a remainder of operands". The secondary reference does not necessary disclose or teach every limitation in the claims.

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**(11) Related Proceeding(s) Appendix and Evidence Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

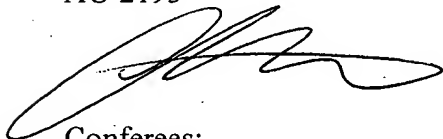
Further, no evidence in addition to those already of record is identified in the Evidence Appendix.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Chat C. Do

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Conferees:

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